NON-PUBLIC?: N
ACCESSION #: 8910050397
LICENSEE EVENT REPORT (LER)

FACILITY NAME: HOPE CREEK GENERATING STATION PAGE: 1 OF 4

DOCKET NUMBER: 05000354

TITLE: REACTOR SCRAM CAUSED BY FAILURE OF SOLDERED SCRAM VALVE PILOT
AIR LINE - INSTALLATION DEFICIENCY
EVENT DATE: 08/30/89 LER #: 89-017-00 REPORT DATE: 09/30/89

OPERATING MODE: 1 POWER LEVEL: 082

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: R.B. Cowles, Lead Engineer - Technical

TELEPHONE: 609-339-5264

COMPONENT FAILURE DESCRIPTION:
CAUSE: B SYSTEM: LD COMPONENT: PSF MANUFACTURER: B130
REPORTABLE NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: (16)

On August 30, 1989 at 0112, a reactor scram occurred as a result of a low reactor pressure vessel (RPV) water level (+12.5") signal. The transient was initiated by the failure of a 1/2" soldered connection where the scram pilot air line from Control Rod Drive (CRD) hydraulic control unit (HCU) 34-59 joined a 1-1/2" air header interconnecting a bank of HCU's on the south side of the Reactor Building. This failure resulted in the rapid depressurization of the scram air header, and in response, control rods began to insert. The ensuing void collapse resulted in an unrecoverable low level transient and the subsequent scram. Failure analysis following the scram determined the root cause of the initial air line failure to be deficiencies in initial installation of the air line during plant construction. Immediate corrective actions included radiography of similar joints prior to restarting th
plant, leak

checking all soldered connections at all 185 scram pilot air header risers, and pull testing all 185 tee joints to demonstrate the ability of the joints to withstand normal operating stresses. Long term corrective actions include completion of an ongoing testing program for instrument air piping prior to the end of the current refueling outage.

END OF ABSTRACT

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor (BWR/4)
Control Rod Drive (EIIS Designation: AA)
Instrument Air System (EIIS Designation: LD)

IDENTIFICATION OF OCCURRENCE

Reactor Scram Caused By Failure of Soldered Scram Valve Pilot Air Line - Installation Deficiency

Event Date: 08/30/89
Event Time: 0112
This LER was initiated by Incident Report No. 89-093

CONDITIONS PRIOR TO OCCURRENCE

Plant in OPERATIONAL CONDITION 1 (Power Operation), Reactor Power 82%, Unit Load 875MWe. Power coastdown in progress for scheduled refueling outage.

DESCRIPTION OF OCCURRENCE

On 8/30/89 at 0112, a Control Rod Drive (CRD) Accumulator Trouble overhead alarm was received in the control room. As the Nuclear Control Operator (NCO, RO Licensed) was acknowledging the alarm, he observed that the lower right hand quadrant of the full core display was illuminated with blue "SCRAM" lights and green "FULL IN" lights. This observation was immediately followed by an identical display on the left side. Before the NCO could react, a reactor scram occurred on a low water level signal (+12.5"), primarily due to collapsing voids as a result of the instantaneous power reduction. Reactor vessel level decreased to approximately -15" before being returned to normal levels with the feedwater system. With minor exceptions (detailed in the "Analysis" section of this report), all systems functioned as designed and recovery from the transient was uneventful. A four hour non-emergency report was

initiated IAW 10CFR50.72 and the Hope Creek Event Classification Guide.

APPARENT CAUSE OF OCCURRENCE

A Significant Event Response Team which convened immediately following the scram determined the following:

APPARENT CAUSE OF OCCURRENCE, CONT'D

The initiating cause of this event was the failure of a 1/2" soldered connection where the scram valve pilot air line from CRD Hydraulic Control Unit (HCU) 34-59 joins a 1-1/2" air header interconnecting a bank of HCU's on the south side of Reactor Building E1. 102'. This failure resulted in an unisolateable, rapid depressurization of the subject air header, which caused all rods to insert.

Failure analysis determined the root cause of the air line soldered connection failure to be an installation deficiency during plant construction. The 1/2" air line was misaligned in its connection to the 1-1/2" air header and installed in the connection with insufficient depth of insertion.

ANALYSIS OF OCCURRENCE

During the course of the transient, the following plant features did not respond as expected:

1. The Feedwater System startup level control valve did not respond in automatic, and was attributed to an unrelated failure of the associated level controller during the course of scram recovery.

2. Control Rod 34-27 did not indicate fully inserted following the scram. This failure to indicate has been attributed to a problem with the rod position indication switch at notch 48. The rod was verified to be fully inserted.

PREVIOUS OCCURRENCES

No instances of air line failures leading to reportable events have occurred at Hope Creek. NRC Generic Letter 88-14, regarding previous instances of degraded instrument air quality at other facilities, was the subject of a PSE&G response earlier this year.

SAFETY SIGNIFICANCE

The safety impact of this event was minimal. General Electric analyzed the effect of rod insertions on core thermal limits as the scram air header depressurized, and determined that fuel thermal safety limits were not violated.

CORRECTIVE ACTIONS

1. Radiographic examination of 20 selected 1/2" to 1-1/2" air line connections was performed. During this examination, the connections were verified for complete insertion and proper utilization of installation scribe marks. No discrepancies in installation were observed during this examination.

2. Soldered connections at all 185 pilot air header risers were leak checked, and these connections were pull tested to demonstrate the ability of the joints to withstand normal operating stresses.
six, joints did not meeting the testing requirements. These joints were reworked and subsequently retested.

3. Hope Creek will complete an ongoing testing program for all large and small bore instrument air piping prior to completion of the current refueling outage.

4. Hope Creek Operations is reviewing the recommendations of the Significant Event Response Team, and will implement recommendations as deemed appropriate.

Sincerely,

J.J. Hagan
General Manager -
Hope Creek Operations

RBC/
SORC Mtg. 89-107

PSEG
Public Service Electric and Gas Company P.O. Box 236 Hancocks Bridge, New Jersey 08038

Hope Creek Operations

October 2, 1989

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Dear Sir:

HOPE CREEK GENERATING STATION
DOCKET NO. 50-354
UNIT NO. 1
LICENSEE EVENT REPORT 89-017-00

This Licensee Event Report is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(iv).

Sincerely,

J.J. Hagan
General Manager -
Hope Creek Operations

RBC/

Attachment SORC Mtg. 89-107

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